HEAT EXCHANGERS:
Removal of existing Leslie Constantemp Heat Exchangers (Model E320L, serial #s' RB & LC) and demo piping back to new connection points. See attached Heat Exchanger Floor Plan 20090604.pdf.
Provide and install Armstrong International 535-PP-PTWDMC1-PR Flo-Rite-Temp Instantaneous water heater package or equal. This skid mounted unit incorporates factory pre-piped 535 water heaters (Qty 2) (1 unit for 100% redundancy), steam traps, air vents, thermometers, one (1) DMC1 digital mixing valve to mix down and control the low-temp loop, and one (1) thermostatic diverting valve to control the 140F loop.

REQUIRED FACTORY OPTION for BrainScan 1 communication:
DMC1 mixing valve shall be supplied with BrainScan 1 communication and monitoring package capable of providing hot water supply, cold/recirculation water supply and blended water outlet temperature readings. It shall accommodate a socket for a protocol translator module capable of communicating with BacNet, Lonworks FFT as well as a modem and wi-fi module. A software package compatible JCI Metasys shall be included with a valve/system graphic.

Work includes all plumbing, pipe fitting (steam) as well as installation of new insulation on all new or re-worked pipe.
Connect new BrainScan1 to the existing Building Automation System, JCI Metasys, and program monitored temperature points.
Work to include all materials and labor.

1. General:
    a. The parallel instantaneous water heater package with DMC1 shall be mounted on an angle iron frame.
    b. The package shall be pre-plumbed with all required components and pressure tested. Packages which require field assembly other than basic water, and steam service shall be unacceptable.
    c. The instantaneous water heater shall operate on water differential using the feed forward principle and shall not use a feedback temperature control device with capillary system.
    d. The tube bundle shall be fixed on one end and free floating on the other for easy removal. The tubes shall be straight with a removable end cap to facilitate cleaning. "U" and helical tubes shall be unacceptable.
    e. The water controlling valve shall be mounted integral to the heat exchanger without the use of connecting piping. Only the necessary steam, water and condensate connections to the instantaneous water heater shall be pre-plumbed. Copper lined storage tanks shall not be used.
    f. Temperature controller shall be controlled digitally via integrated circuit board technology designed to deliver blended water economically at a safe, accurate temperature for sanitary use in re-circulated hot water systems.
2. Materials of construction and items included shall be:

a. Shells of carbon steel with 2-1/2" NPT steam inlet and 1" NPT condensate exit ports
b. Tubes of 5/8" 16 gauge admiralty brass expanded into brass tube sheets
c. Water control valve body of bronze with brass internals and having 1-1/2" NPT water connections
d. Stand of 2" Carbon Steel Angle
e. Water pipe of Type L copper
f. Armstrong Steam Trap model 813
g. Armstrong Thermostatic Air Vent
h. One 12V Digital Recirculating Valve (DRV80)
i. One UL Listed Power supply's rated at 100-240V (12V AC ouput)
j. 2 x 4-20 mA current loop interfaces:
k. Input: Setpoint Selection
l. Output: Measured Blend Temperature
m. Relay output: 24V DC/240V AC SPCO
n. Error Relay: Activated in alarm or error mode
o. RS 485 Serial Data Connection Port
p. External Network Adapter
q. All required valve fittings and isolation valves, pressure gauges, inlet combination ball valve strainers, inlet/return check valves, inlet, system blend and return line thermometers
r. All Stainless Steel Construction (DRV80 only)

3. Performance:
    a. The instantaneous water heater shall be of the horizontal shell and tube design providing easy access to the individual tubes without moving the heater from its installed position.
    b. No overhead clearance shall be required for servicing.
    c. The Digital Mixing Center (DMC) shall deliver up to 150 gpm with no minimum system draw-off requirement.
        i. The DMC shall have a 2 line, 16 character display of delivered temperature with the option of °F or °C.
    d. Display also shows the error codes and alarm conditions.
    e. Setpoint configuration, unit selection, and alarm conditions available via the IrDA programming port used with the programming software or via the Building Automation System.
    f. The DRV80 shall have an integral data port for the 4-20 mA interfaces.
    g. The DRV80 shall also include an integral serial data (RS485) connection port for a multitude of Building Automation Interface as well as Internet connectivity.
    h. The temperature controller shall be compliant with ASSE Standard 1017 and CSA B125 and so certified and identified.
    i. The temperature controller shall be compliant with ASSE Standard 1017 and CSA B125 and so certified and identified.
    j. Model shall be 535PP-PTW by Armstrong Hot Water Group or equal.

4. The instantaneous water heater package with DMC1 shall include all of the following capabilities:
    a. Maximum water pressure drop not exceeding 10 psi in the instantaneous heater
    b. Operational steam pressure of 2-15 psig
    c. Maximum allowable steam pressure of 150 psig
    d. Operational water pressure of 20-150 psig
    e. Maximum allowable water pressure of 150 psig
    f. Accurate control of blended water drawn from the system at a point of use typically within +/-2°F at draw off points a minimum of 5m downstream of mixing valve during consistent system demand periods
    g. Minimum valve inlet to outlet temperature requirement (system recirculation temperature loss) of 2°F
    h. Automatic shutoff of hot water flow upon cold water inlet supply failure
    i. Automatic shutoff of hot water flow in the event of a power failure
    j. Maintain a consistent system "idling" temperature and control "temperature creep" without the use of a manual throttling device or balance valve.
    k. System shall not require a temperature activated pump shut-off device (aquastat).
    l. Programmable set point range of 100-160°F (37-71°C) plus full hot/full cold
    m. Ability to thermally disinfect at recommended temperatures
    n. Programmable 1st level hi/lo temp alarm display
    o. Programmable 2nd level hi/lo temp alarm display/full cold
5. The DMC1 shall include an integral Digital Hot Water Management System Console with the following capabilities
    a. Hot Water Management System Console shall be factory configured to engage with either a Local Area Network, a third party Building Automation System, or an Internet Provider to enable the mixing units (DRV 80) integral monitoring features.
    b. Hot Water Management System Console configurations shall include hardware and software options which include on screen system graphics which are compatible with most standard Building Automation System open protocols.
    c. Hot Water Management System Console shall interface directly with DRV 80 via an integral serial port so that all standard alarm conditions and error messages available through the DRV80 are received and further transmitted.
6. Technical: Hot Water Management System Console shall include the following options:
    a. Shall utilize the SoM-5282 System on Module as the processing engine and uClinux as the operating system

b. Shall accommodate a socket for a protocol translator module that is capable of communicating with BacNet MSTP, Lonworks FTT, as well as a modem and wi-fi module
c. Shall include standard Ethernet port available to bring system on to the Internet via a secured HTTP network server
d. System shall display "real-time" values as well as store data to be downloaded by the facility into their preferred program
e. Shall include integral data storage with XML formatted files export capability written at 15 minute intervals
f. Shall include an editor accessible via telnet allowing user maintenance and will assign user privileges, which consist of Read Only or Read and Configure